Claims

1. A semiconductor ridge waveguide laser diode including
   - a semiconductor body (1)
   - an active region (2, 3, 7) including a ridge (4)
   - front and back facets each with a mirror (10, 12)
   - a metallization (6) over said body and said ridge for injecting carriers into said active region

   characterized by
   - means (11, 13) for limiting said injection of carriers by providing an un-pumped section in the vicinity of said front and/or said back facet.

2. The laser diode according to claim 1, *wherein*
   - two means (11, 13) for limiting the injection of carriers are provided, one each at the front and the back end of the laser diode.

3. The laser diode according to claim 1, *wherein*
   - the means for limiting the injection of carriers is an isolation layer (11, 13) between the laser diode's active region (2, 3, 4, 7) and the metallization (6).

4. The laser diode according to claim 3, *wherein*
   - the isolation layer (11, 13) between the laser diode's active region (2, 3, 4, 7) and the metallization (6) is made from SiO_2, Al_2O_3, TiN or, preferably, SiN.

5. The laser diode according to claim 3, *wherein*
   - the isolation layer (11, 13) is extending under only a fraction of the area of the metallization (6).

6. The laser diode according to the claim 3, *wherein*
- the isolation layer is about 50 nm thin and preferably covers an area of approximately 20 µm x 40 µm.

7. The laser diode according to claim 3, *wherein*
- the isolation layer's (11, 13) longitudinal extension is at least as long as, preferably longer than, the mean diffusion lengths of the free carriers within the laser's active region (2, 3, 7).

8. The laser diode according to claim 3, *wherein*
- the isolation layer's (11, 13) longitudinal extension is selected to avoid onsetting inhomogeneities in the P-I characteristics just above the laser threshold.

9. The laser diode according to claim 3, *wherein*
- the isolation layer's (11, 13) lateral extension is wider than the laser's waveguide ridge (4), but smaller than the metallization's lateral extension.

10. The laser diode according to claim 3, *wherein*
- the laser diode substrate is GaAs,
- the active region is AlGaAs/InGaAs, and
- the isolation layer is SiN.

11. A method of making a high power ridge waveguide laser diode, *including*
- providing at least one unpumped end section by inserting a patterned isolation layer (11, 13) between the laser diode's active region (2, 3, 4) and a metallization (6) injecting carriers into said active region.

12. The method according to claim 11, *wherein*

- the patterned isolation layer (11, 13) is formed by in-situ controlled chemical reactive ion etching of a deposited SiO_2, Al_2O_3, TiN or, preferably, SiN layer.

13. The method according to claim 11, *wherein*

- the isolation layer is PECV-deposited on a whole wafer,
- the patterning is defined in a photolitographical step by realizing approximate rectangles of resist above the regions forming the unpumped end sections, and
- said resist is used as a mask for a subsequent dry chemical etch process which removes unwanted parts of said isolation layer.